360225

FLOOD INSURANCE STUDY

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TOWN OF ALDEN, NEW YORK
ERIE COUNTY

DECEMBER 1, 1980

federal emergency management agency
federal insurance administration

COMMUNITY NUMBER - 360225

FEMA 209

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index

Flood Insurance Rate Map

FLOOD INSURANCE STUDY
TOWN OF ALDEN, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Town of Alden, Erie County, New York, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert Alden to the regular program of flood insurance by the Federal Insurance Administration (FIA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these federally-supported studies are based. These criteria take precedence over the minimum federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.3. In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Goodkind and O'Dea, Inc. for the Federal Insurance Administration, under Contract No. H-3831. This work was completed in December 1976. The hydrologic and hydraulic analyses for this study were conducted by Parsons, Brinckerhoff, Quade and Douglas under subcontract to Goodkind and O'Dea, Inc.

1.3 Coordination

A series of meetings were held with the U. S. Geological Survey (USGS) and the U. S. Army Corps of Engineers (COE), local administrative officials, and other interested parties. The purpose of these meetings was to establish background information, analyze existing flood plain zoning, coordinate engineering efforts, and inform the

community of study progress. An initial Consultation and Coordination Officer's (CCO) meeting was held on September 25, 1975, with representatives from the FIA, the study contractor, and the Town of Alden attending.

Coordination meetings included discussion of the methodologies used for evaluating the hydrology of ungaged streams and discussion of available gaging station records. Technical assistance was furnished by the offices of the USGS in Albany and the COE in Buffalo, New York.

Contact with local authorities was maintained through the office of the Town Supervisor.

A search for available basic data was made at all government levels. The office of the Town Supervisor provided various land use, zoning, and other municipal maps of the Town of Alden.

Basic hydrologic data, as well as maps of flood-prone areas, were provided by the USGS office in Albany, New York.

A final CCO meeting was held on March 3, 1980, with representatives from the FIA, the study contractor, and the Town of Alden attending.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Alden. The area of study is shown on the Vicinity Map (Figure 1). Not included in this study was the incorporated area of the Village of Alden which is located within the corporate boundaries of the Town of Alden.

Cayuga Creek and Ellicott Creek were studied by detailed methods. Cayuga Creek enters the town through the southern corporate limits, flows in a northerly direction for a short distance and turns west and flows across the town to the western corporate limits. Ellicott Creek enters the town through the eastern corporate limits and flows in a general westerly direction to the western corporate limits. The portion west of Crittenden Road was studied in detail.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction for the next five years, through December 1981.

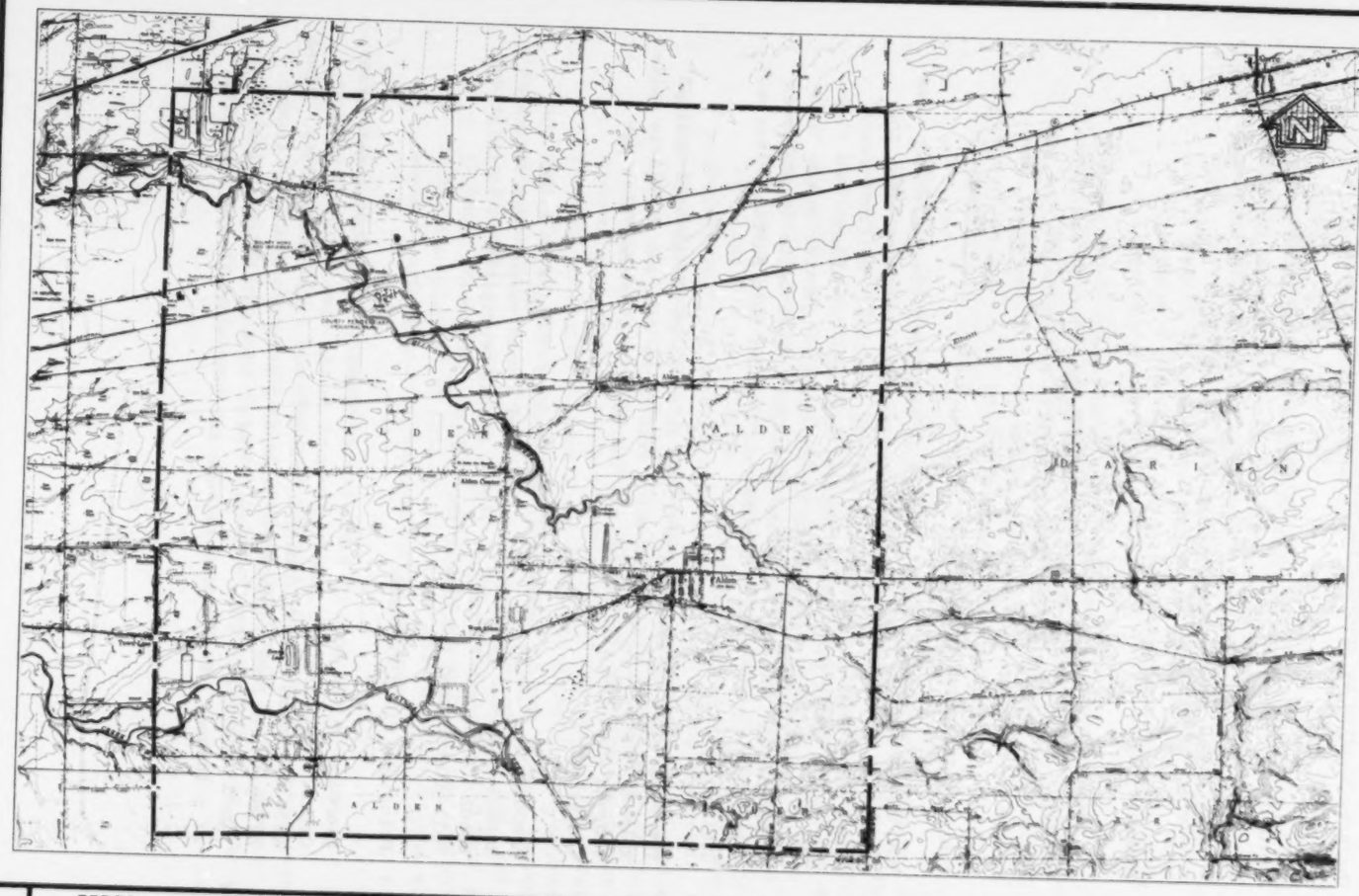


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

APPROXIMATE SCALE
6000 0 6000 12000 18000 FEET

VICINITY MAP

The area studied by approximate methods was Ellicott Creek east of Crittenden Road.

Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FIA.

2.2 Community Description

The Town of Alden is situated in the southeastern corner of Erie County in northern New York. The town is bordered by the Town of Newstead to the north, the Town of Marilla to the south, the Town of Darien to the east, and the Town of Lancaster to the west. The town covers an area of 34 square miles and is predominantly a single-family residential community.

The topography of the Town of Alden is basically flat, although some undulation occurs toward the south. Steep slopes occur along the creek banks and in the southern portion of Alden. Ellicott Creek and Cayuga Creek provide the natural drainage for Alden. The flow is in a westerly direction. Ellicott Creek originates in the Town of Bennington and empties into the Niagara River while Cayuga Creek originates in the Town of Sheldon and empties into Buffalo River and ultimately into Lake Erie.

The soil cover of the Town of Alden is composed of the well-drained Palmyra loams, Darien soils which tend to be wet, and Scholarie soils (Poygan loam and silt) which are characterized by poor drainage (Reference 1).

A moderate climate prevails in the Town of Alden with an average annual rainfall of about 37 inches and a mean annual temperature of about 47 degrees Fahrenheit (°F). Annual precipitation is relatively well-distributed throughout the year.

2.3 Principle Flood Problems

Flooding in the Town of Alden occurs along Ellicott Creek and Cayuga Creek. The greatest flood of record in the area occurred in March 1936 and caused heavy damage by washing out roads and bridges. These bridges have been replaced by more adequate structures. A recent flood occurred in July 1963 as a result of an intensive rainstorm of 6 inches. No flooding records are available for the community.

2.4 Flood Protection Measures

No flood protection structures exist in the Town of Alden.

A town ordinance was passed in November 1973, this ordinance defines the stream flood plains and controls any encroachment thereon. The town is currently studying a proposed drainage ordinance which would require a permit for any private development which might modify the rate of run-off.

Due to zoning regulations in the Town of Alden no development, commercial or residential, is permitted in the flood plain.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one-percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten) and, for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

For Ellicott Creek, the peak discharge-frequency relationships of six USGS gaging stations on Tonawanda Creek, Ellicott Creek, and Little Tonawanda Creek (References 2 and 3) were first established using the standard log-Pearson Type III method, as recommended by the Water Resources Council (Reference 4). The length of record of these stations ranges from 10 to 61 years. The longest record is available from USGS Gage No. 2165 on Little Tonawanda Creek at Linden which has been in operation since July 1912, with two years of missing flood records.

For Cayuga Creek, the peak discharge-frequency relationships of nine USGS gaging stations on Cattaraugus Creek, Eighteenmile Creek, Smoke Creek, Buffalo Creek, Little Buffalo Creek, Cayuga Creek, Cazenovia Creek, and Scajaquada Creek (References 2 and 3) were first established using the standard log-Pearson Type III method, as recommended by the Water Resources Council (Reference 4). The length of record for these stations ranges from 11 to 35 years. The longest record is available from USGS Gage No. 2150 on Cayuga Creek near Lancaster, which has been in operation since September 1938, with one year of missing records.

A set of regional flood frequency curves was then established for each creek by correlating peak discharge and drainage area information of these gaging stations.

A summary of drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
ELLICOTT CREEK					
At downstream corporate limits	60.0	3,500	4,800	5,400	6,750
Upstream of the confluence of Spring Creek	27.6	2,300	3,150	3,700	4,500
CAYUGA CREEK					
At downstream corporate limits	59.1	5,450	7,750	8,800	11,350
Upstream of Two Rod Road and upstream of unnamed tributary	56.0	5,250	7,450	8,450	10,900

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Water-surface elevations were developed using a HEC-2 computer step-backwater model (Reference 5). The starting water-surface elevations for Ellicott Creek were determined by 100-year and 50-year elevations derived from the COE, Flood Plain Information report for Ellicott Creek (Reference 6) and by slope/area method which was used for derivation of 10-year and 500-year starting elevations. The starting water-surface elevations for Cayuga Creek were obtained by slope/area method.

Cross-section data for streams in the area were obtained from photogrammetric surveys; the below-water sections were obtained by field measurement. All bridges and culverts were surveyed to obtain elevation data and cross sections were located at close intervals upstream and downstream of bridges and culverts in order to compute significant backwater effects of these structures. In addition, cross sections were taken between hydraulic controls wherever warranted by topographic changes.

Roughness coefficients (Manning's "n") for the computations were estimated on the basis of field inspection of the channel and overbank areas. For Ellicott Creek and Cayuga Creek the roughness coefficients were 0.03 for the channel and 0.06 for the overbanks.

Elevations on the stream studied by approximate methods were determined by normal depth calculations.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 3).

All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the maps.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if hydraulic structures remain unobstructed and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 5 feet (Reference 7). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year boundary has been shown.

For the stream studied by approximate methods, the elevation of the 100-year flood was developed from normal depth calculations and the boundary was plotted using the topographic maps referenced above.

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 3). Small areas within the flood boundaries may lie above the flood elevations and, therefore, may not be subject to flooding. Owing to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in

flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plains. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 3), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown. Portions of the floodway widths of Ellicott Creek extend beyond the corporate limits.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source affecting the Town of Alden.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Ellicott Creek								
A	142,160	80	578	9.3	747.0	747.0	747.9	0.9
B	142,385	87	651	8.3	748.6	748.6	748.6	0.0
C	142,770	160	1,126	4.8	749.1	749.1	749.7	0.6
D	143,820	239	1,527	3.5	750.0	750.0	750.8	0.8
E	145,660	180	927	5.8	751.9	751.9	752.6	0.7
F	146,700	110	768	6.9	754.2	754.2	754.5	0.3
G	146,850	85	418	12.7	754.2	754.2	754.5	0.3
H	147,580	125	853	6.2	757.7	757.7	757.9	0.2
I	148,990	252	1,977	2.7	758.5	758.5	759.3	0.8
J	149,550	220	1,299	3.4	758.7	758.7	759.6	0.9
K	150,165	160	679	6.6	759.1	759.1	759.9	0.8
L	151,145	91	651	6.9	761.7	761.7	762.2	0.5
M	151,320	206	1,116	4.0	762.5	762.5	762.7	0.2
N	151,610	287	1,243	3.6	762.9	762.9	763.0	0.1
O	152,810	100	686	6.5	763.8	763.8	764.5	0.7
P	154,535	87	644	7.0	766.4	766.4	766.9	0.5
Q	154,705	135	1,087	4.1	767.5	767.5	768.0	0.5
R	156,005	293	435	10.3	768.9	768.9	769.0	0.1
S	157,070	94	739	6.1	772.0	772.0	772.7	0.7

[1]Feet above confluence with Niagara River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOODWAY DATA

ELLICOTT CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Ellicott Creek (continued)								
T	157,185	97	627	7.1	772.4	772.4	772.7	0.3
U	158,200	72	557	8.0	774.2	774.2	774.5	0.3
V	158,400	140	1,076	4.2	775.3	775.3	775.4	0.1
W	159,260	290	1,764	2.5	775.9	775.9	776.3	0.4
X	160,285	285	1,067	4.2	775.9	775.9	776.9	1.0
Y	160,885	112	582	7.7	777.5	777.5	777.7	0.2
Z	161,170	120	688	6.5	778.5	778.5	778.6	0.1
AA	163,160	330	721	6.2	783.5	783.5	783.7	0.2
AB	164,820	207	806	5.6	789.2	789.2	789.9	0.7
AC	165,855	189	807	5.4	791.6	791.6	792.6	1.0
AD	167,580	189	960	4.6	796.9	796.9	796.9	0.0
AE	168,865	219	1,031	4.2	797.9	797.9	798.3	0.4
AF	170,030	155	619	7.1	799.7	799.7	800.2	0.5
AG	170,780	121	442	9.9	803.7	803.7	803.7	0.0
AH	171,025	240	1,662	2.6	806.0	806.0	806.0	0.0
AI	171,615	335	1,626	2.7	806.0	806.0	806.1	0.1
AJ	172,485	117	711	6.2	806.3	806.3	806.3	0.0
AK	173,785	148	895	4.9	808.0	808.0	808.1	0.1
AL	175,185	183	1,201	3.6	809.2	809.2	809.3	0.1

[1]Feet above confluence with Niagara River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Ellicott Creek (continued)								
AM	176,140[1]	187	1,404	2.9	809.6	809.6	809.9	0.3
AN	178,640[1]	250	1,454	2.8	810.4	810.4	811.0	0.6
AO	185,550[1]	750[3]	3,429	1.0	815.1	815.1	815.8	0.7
AP	187,265[1]	354	1,034	3.4	815.2	815.2	816.2	1.0
AQ	188,215[1]	160	803	4.4	817.4	817.4	817.4	0.0
AR	188,410[1]	190	640	5.5	817.4	817.4	817.4	0.0
Cayuga Creek								
A	84,810[2]	163	814	10.8	743.8	743.8	743.8	0.0
B	86,825[2]	240	1,693	5.2	749.7	749.7	750.7	1.0
C	88,010[2]	295	1,066	8.3	752.5	752.5	752.7	0.2
D	89,385[2]	143	1,058	8.3	756.9	756.9	757.6	0.7
E	90,985[2]	220	882	10.0	762.8	762.8	762.8	0.0
F	92,345[2]	273	1,735	4.9	767.8	767.8	768.3	0.5
G	93,455[2]	277	1,674	5.1	769.1	769.1	769.8	0.7
H	94,370[2]	130	862	9.9	770.4	770.4	771.2	0.8
I	94,580[2]	135	930	8.9	772.9	772.9	772.9	0.0
J	95,620[2]	159	743	11.2	776.4	776.4	776.5	0.1

[1]Feet above confluence with Niagara River
[2]Feet above confluence with Buffalo River
[3]This width extends beyond corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOODWAY DATA

ELLICOTT CREEK AND CAYUGA CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Cayuga Creek (continued)								
K	96,665	134	715	11.6	782.9	782.9	783.1	0.2
L	98,305	362	1,946	4.3	788.6	788.6	789.5	0.9
M	99,405	205	867	9.6	791.5	791.5	791.7	0.2
N	99,585	105	605	13.7	794.0	794.0	794.3	0.3
O	101,155	185	1,210	6.9	800.5	800.5	801.5	1.0
P	102,995	278	1,224	6.8	805.5	805.5	805.5	0.0
Q	104,015	133	719	11.6	809.2	809.2	809.2	0.0
R	104,160	160	1,129	7.4	811.3	811.3	811.4	0.1
S	104,895	192	879	9.4	814.0	814.0	814.0	0.0
T	106,295	191	1,027	8.1	820.2	820.2	820.6	0.4
U	107,755	273	845	9.8	827.6	827.6	827.6	0.0
V	109,105	268	1,588	5.2	831.2	831.2	832.2	1.0

[1]Feet above confluence with Buffalo River

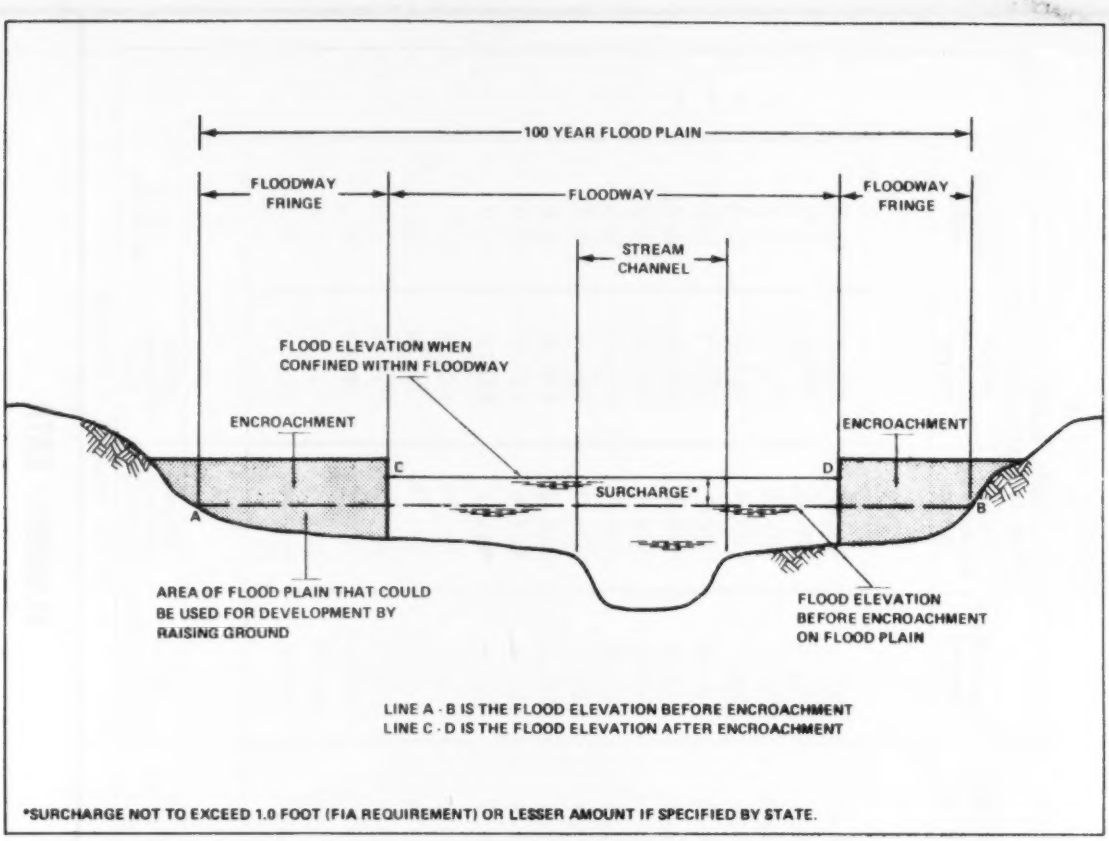
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOODWAY DATA

CAYUGA CREEK


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC Figure 2

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of the Town of Alden are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is the FIA device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Town of Alden was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A: Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.

Zone A3: Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.

Zone B: Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also, areas subject to certain types of 100-year shallow flooding where

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Ellicott Creek Reach 1	05,10	-1.5	-0.5	+0.9	015	A3	Varies
Cayuga Creek Reach 1	10	-1.5	-0.4	+0.9	015	A3	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOOD INSURANCE ZONE DATA

ELLICOTT CREEK AND CAYUGA CREEK

depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the Town of Alden.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Alden is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

A drainage study for the entire Town of Alden was prepared in August 1966. This study encompasses all streams, tributaries and ditches in the area. It is directed primarily toward the adequate development of highway culverts and drains (Reference 8).

A Survey Report for Flood Control and Allied Purposes for Ellicott Creek was prepared by the COE in 1970 (Reference 9). This COE report does not include water-surface profiles for Ellicott Creek in the Town of Alden. Therefore, no comparison has been made between the report and this Flood Insurance Study.

A Flood Plain Information report for Ellicott Creek was prepared by the COE in 1972 (Reference 6). This report includes 50-year and 100-year water-surface profiles for Ellicott Creek in the Town of Alden. There are differences in water-surface elevations between the COE study and this study. The differences, which are at a few cross sections, larger than 2 feet may be attributed to the different number and location of the cross sections surveyed for each study. No other flood-related studies were found for the Town of Alden.

Flood Insurance Studies are being prepared for the adjoining communities of the Town of Newstead and the Town of Darien, New York (References 10 and 11). Flood Insurance Studies are being prepared for the adjoining communities of the Town of Marilla and the Town of Lancaster, New York (References 12 and 13).

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this report can be obtained by contacting the office of the Insurance and Mitigation Division of the Federal Emergency Management Agency, Regional Director, Region II Office, 26 Federal Plaza, Room 19-100, New York, New York 10278.

8.0 BIBLIOGRAPHY AND REFERENCES

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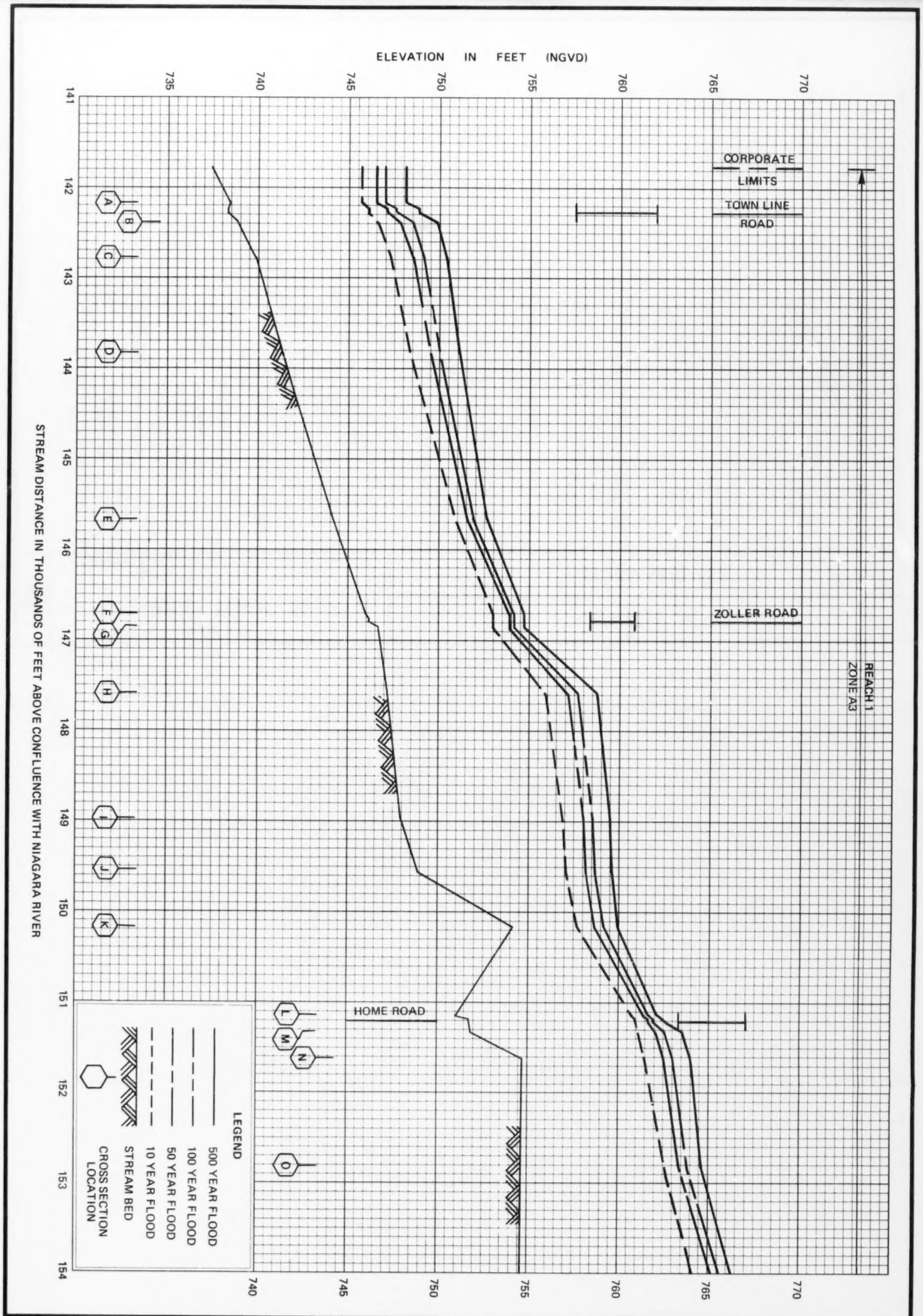


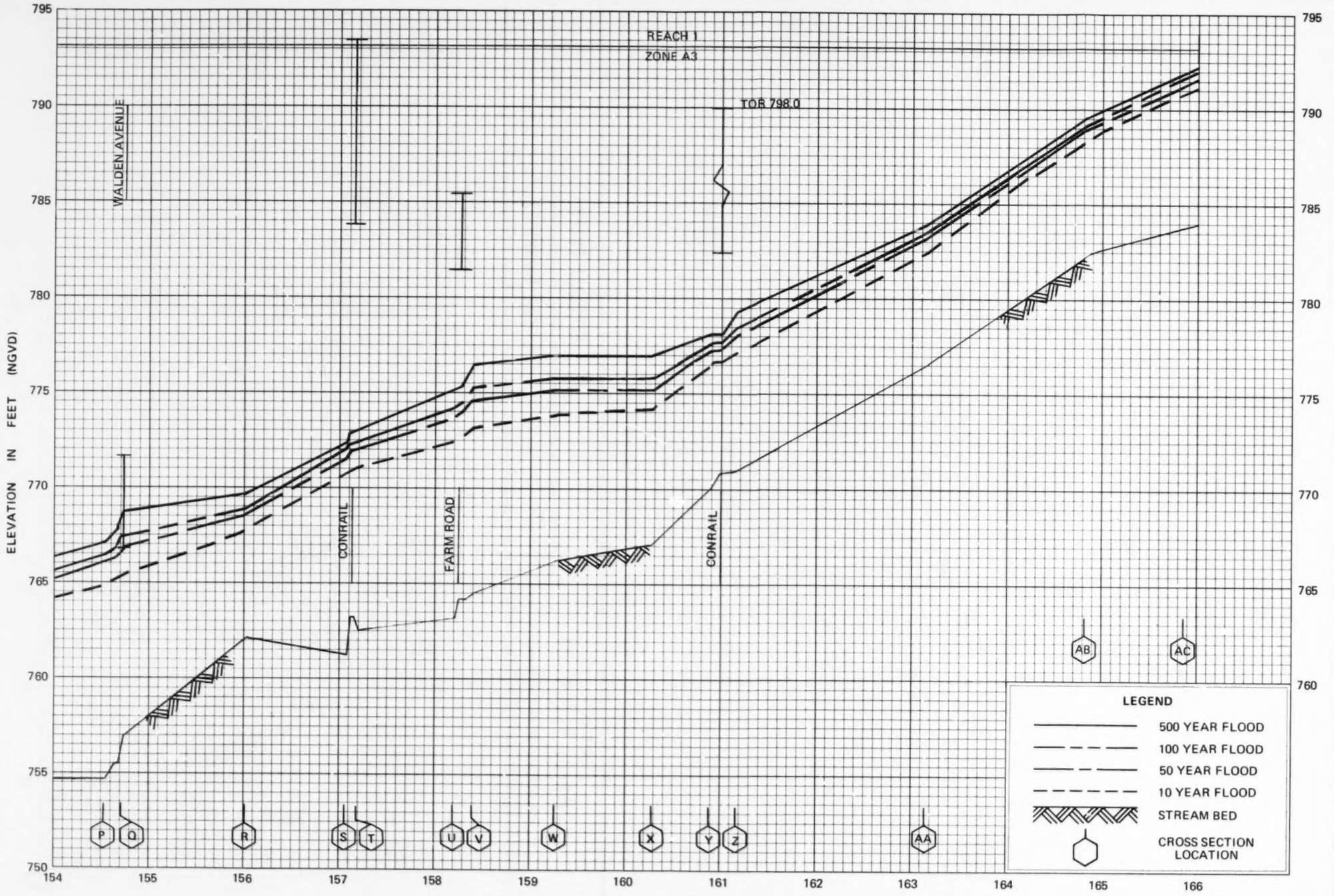
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOOD PROFILES

ELLICOTT CREEK

01P



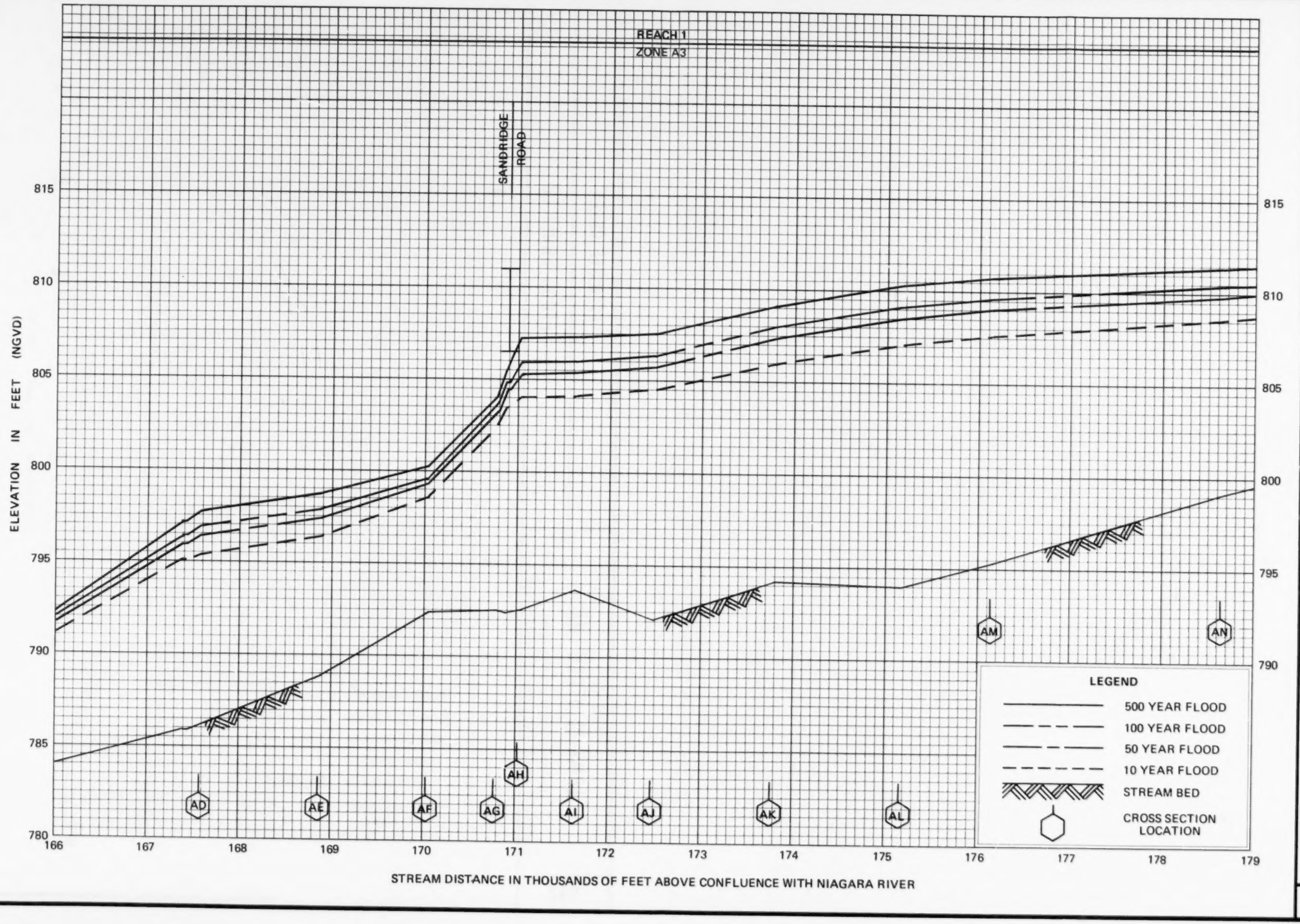
FLOOD PROFILES

ELLICOTT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

02P



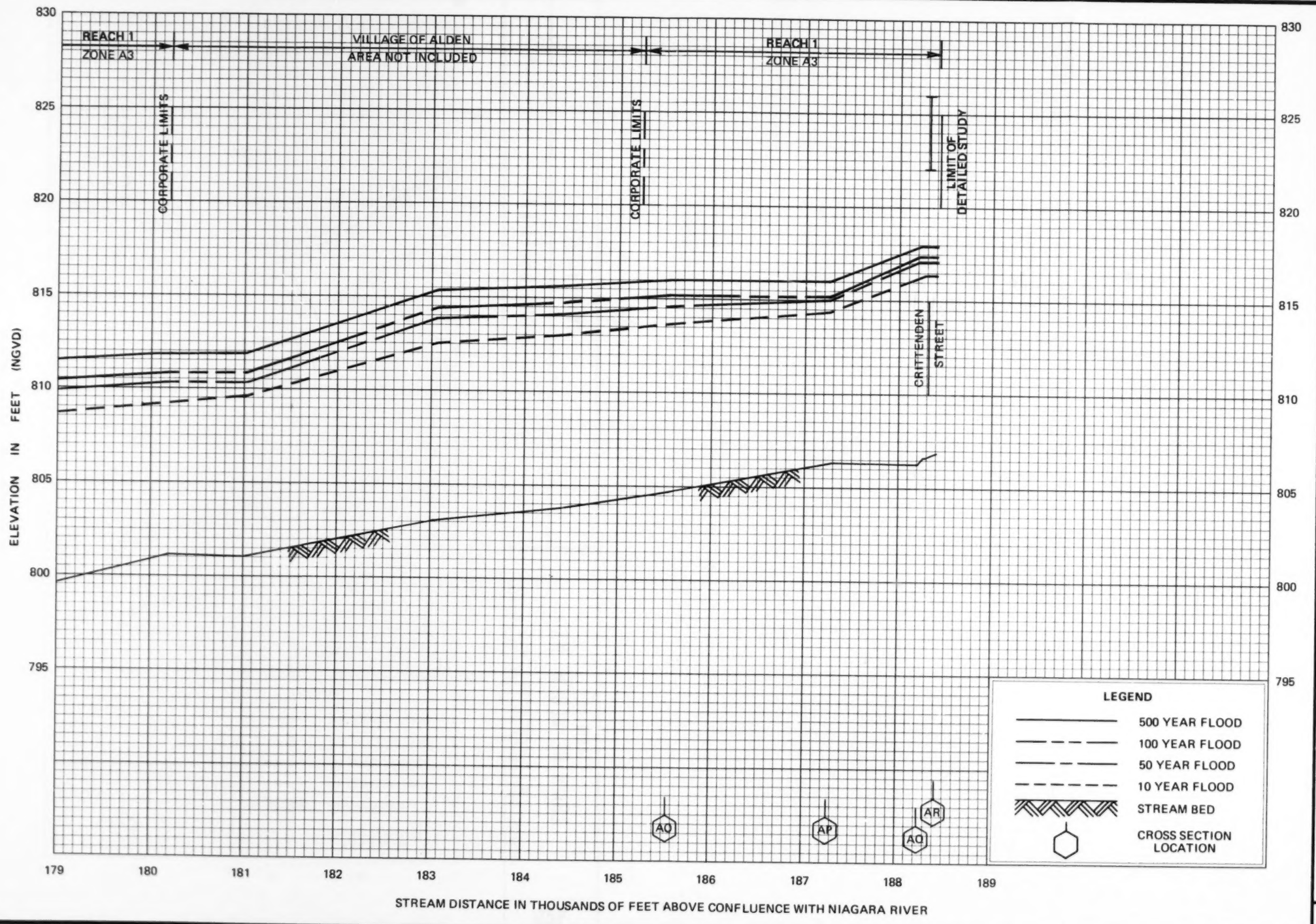
FLOOD PROFILES

ELLICOTT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

03P



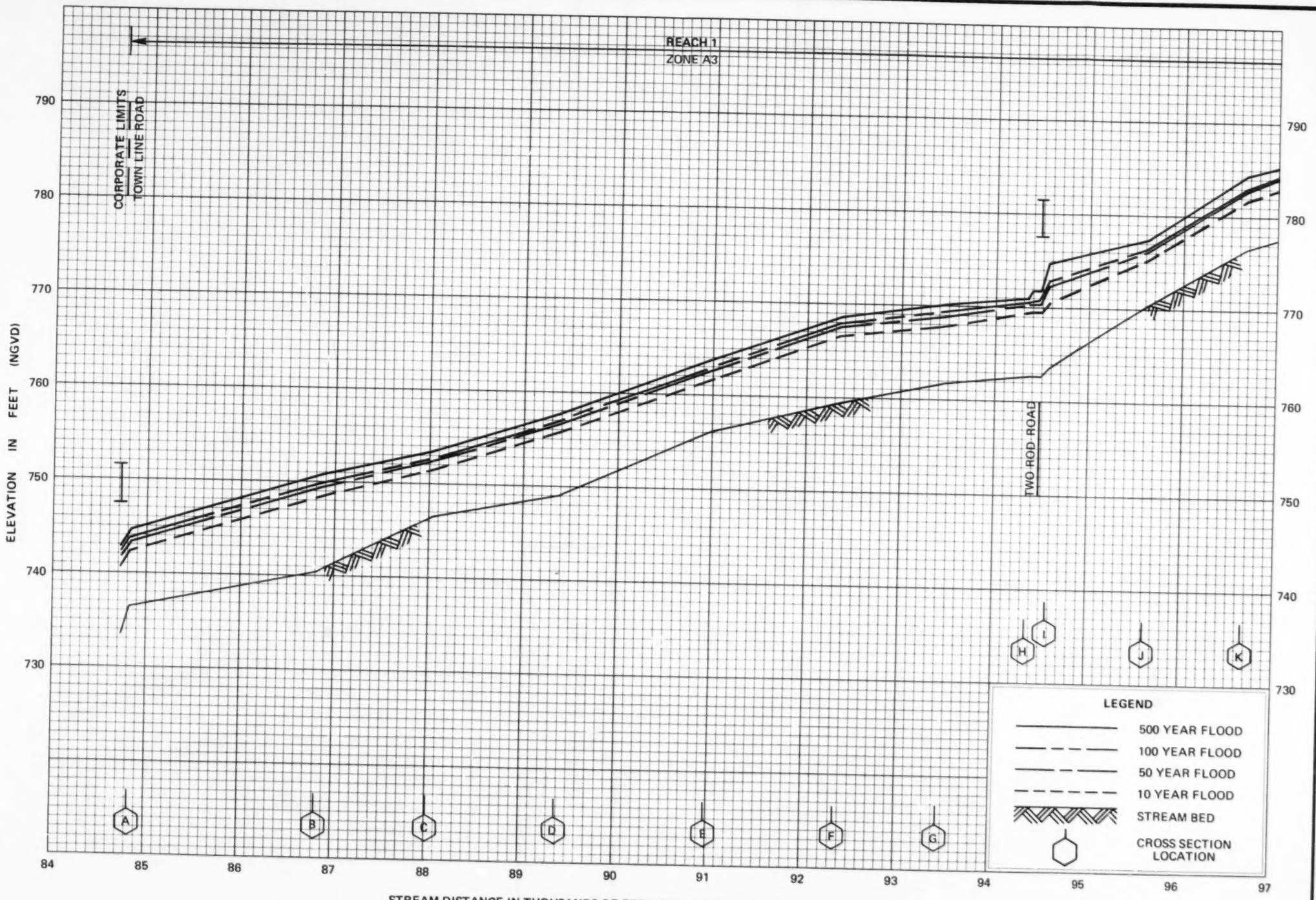
FLOOD PROFILES

ELLICOTT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

04P



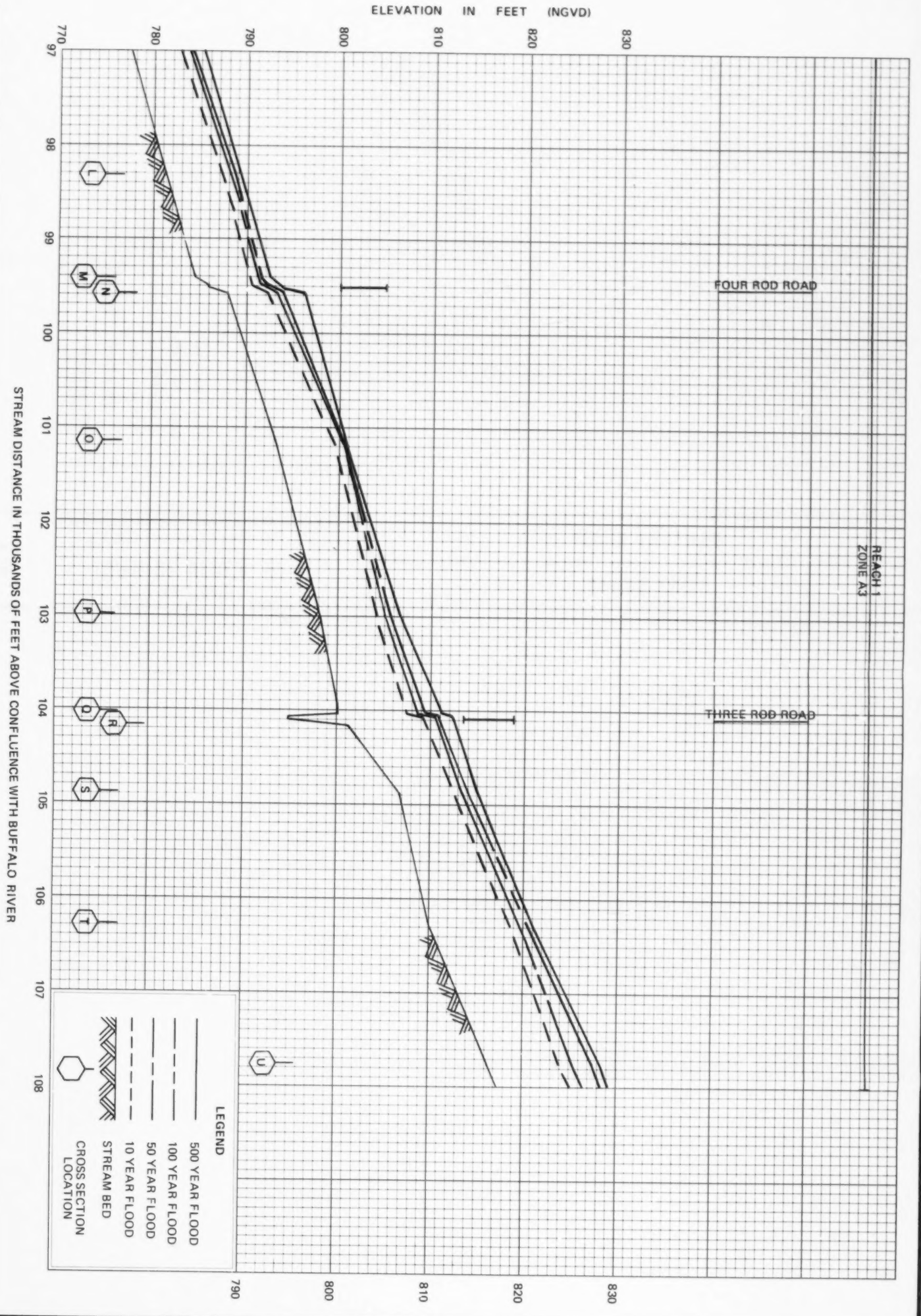
FLOOD PROFILES

CAYUGA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

05P



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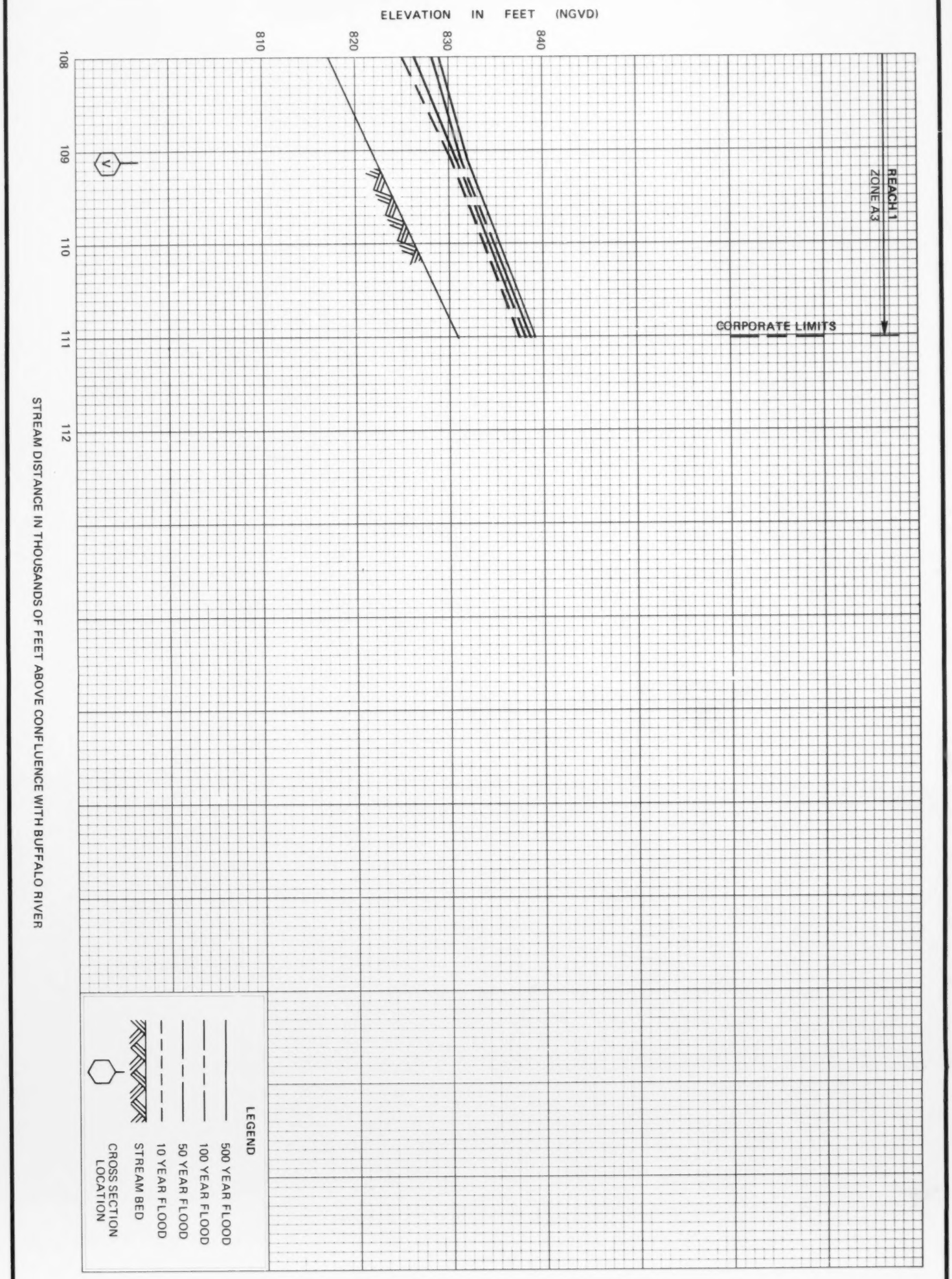
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOOD PROFILES

CAYUGA CREEK



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FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF ALDEN, NY
(ERIE CO.)

FLOOD PROFILES

CAYUGA CREEK